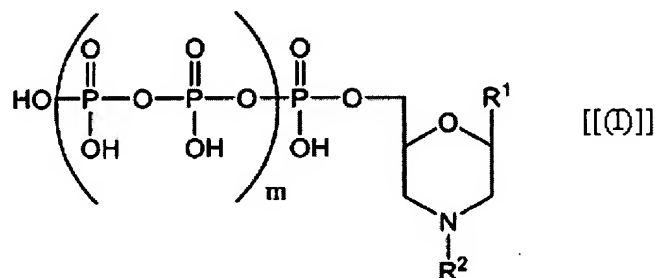


**Amendments to the Claims:**

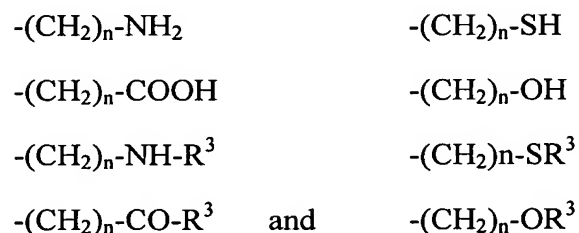
This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently amended): Process for manufacturing a nucleic acid fragment comprising enzymatically incorporating at the 3' OH end of the nucleic acid fragment a modified morpholino-nucleotide having as precursor a compound of formula:



in which R<sup>1</sup> represents a nucleic base, m is 0 or 1 and R<sup>2</sup> is selected from the group consisting of:

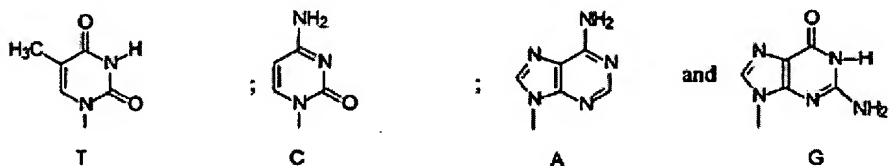


in which n is an integer ranging from 1 to 12 and R<sup>3</sup> is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

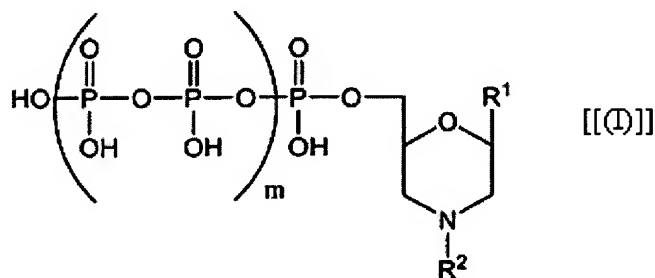
2. (Original): Process according to Claim 1, in which an enzyme of said enzymatic incorporation is the Klenow fragment of DNA polymerase.
3. (Original): Process according to Claim 1, in which an enzyme of said enzymatic incorporation is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.
4. (Original): Process according to Claim 1, in which the nucleic base is a natural

nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

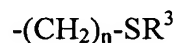
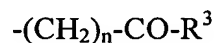
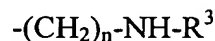
5. (Original): Process according to Claim 1, in which R<sup>1</sup> is selected from the group consisting of:



6. (Original): Process according to Claim 1, in which the label is selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.
7. (Original): Process according to Claim 1, in which R<sup>3</sup> is a fluorophore.
8. (Original): Process according to Claim 1, in which R<sup>3</sup> is selected from the group consisting of fluorescein, biotin, and rhodamine.
9. (Currently amended): Process according to Claim 1, ~~in which the modified morpholino nucleotide is compound (I) in which~~ wherein m is 0.
10. (Original): Process according to Claim 1, in which R<sup>2</sup> represents -CH<sub>2</sub>-COOH, -(CH<sub>2</sub>)<sub>4</sub>-NH<sub>2</sub> or -(CH<sub>2</sub>)<sub>4</sub>-NH-R<sup>3</sup> wherein R<sup>3</sup> is fluorescein.
11. (Currently amended): Process for modifying a nucleic acid fragment comprising enzymatically incorporating at the 3' end of the nucleic acid fragment a modified morpholino-nucleotide having as precursor a compound corresponding to ~~the~~ formula:

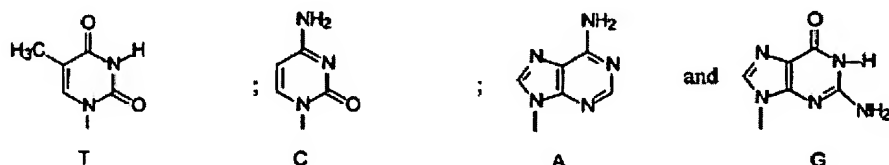


in which  $R^1$  represents a nucleic base,  $m$  is 0 or 1 and  $R^2$  is selected from the group consisting of:



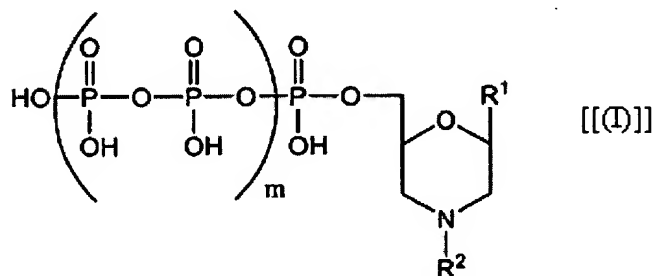
in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of photo-crosslinking agents, fatty acids, hydrophobic peptides, antibodies, enzymes, and fluorophores.

12. (Original): Process according to claim 11, in which an enzyme of said enzymatic incorporation is the Klenow fragment of DNA polymerase.
13. (Original): Process according to Claim 11, in which an enzyme of said enzymatic incorporation is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.
14. (Original): Process according to Claim 11, in which the nucleic base is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.
15. (Original): Process according to Claim 11, in which  $R^1$  is selected from the group consisting of:

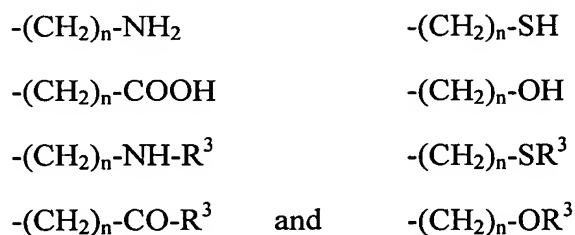


16. (Original): Process according to Claim 11, in which the label is selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.
17. (Original): Process according to Claim 11, in which  $R^3$  is a fluorophore.

18. (Original): Process according to Claim 11, in which  $R^3$  is selected from the group consisting of fluorescein, biotin, and rhodamine.
19. (Currently amended): Process according to Claim 11, ~~in which the modified morpholino-nucleotide is compound (I) in which~~ wherein  $m$  is 0.
20. (Original): Process according to Claim 11, in which  $R^2$  represents  $-\text{CH}_2\text{-COOH}$ ,  $-(\text{CH}_2)_4\text{-NH}_2$  or  $-(\text{CH}_2)_4\text{-NH-}R^3$  wherein  $R^3$  is fluorescein.
21. (Currently amended): Process for sequencing a nucleic acid comprising the technique of enzymatic polymerization of the sequence complementary to this nucleic acid using chain terminators at the 3' end of the complementary sequence, in which at least one of the chain terminators has as precursor a compound corresponding to ~~the~~ formula:



in which  $R^1$  represents a nucleic base,  $m$  is 0 or 1 and  $R^2$  is selected from the group consisting of:



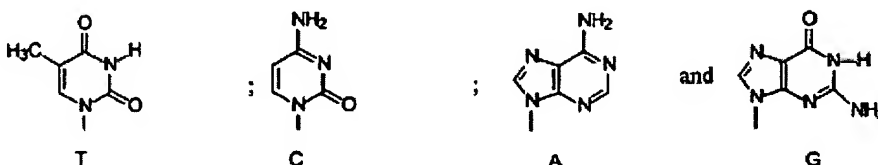
in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

22. (Original): Process according to Claim 21, in which an enzyme of said technique of enzymatic polymerization is the Klenow fragment of DNA polymerase.
23. (Original): Process according to Claim 21, in which an enzyme of said technique of

enzymatic polymerization is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.

24. (Original): Process according to Claim 21, in which the nucleic base is a natural nucleic base selected from the group consisting of adenine, guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine.

25. (Original): Process according to Claim 21, in which  $R^1$  is selected from the group consisting of:



26. (Original): Process according to Claim 21, in which the label is selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.

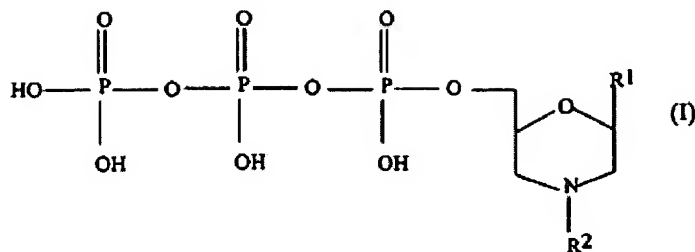
27. (Original): Process according to Claim 21, in which  $R^3$  is a fluorophore.

28. (Original): Process according to Claim 21, in which  $R^3$  is selected from the group consisting of fluorescein, biotin, and rhodamine.

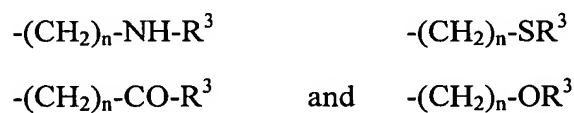
29. (Currently amended): Process according to Claim 21, ~~in which said at least one of the chain terminators is compound (I) in which~~ wherein  $m$  is 0.

30. (Original): Process according to Claim 21, in which  $R^2$  represents  $-\text{CH}_2-\text{COOH}$ ,  $-(\text{CH}_2)_4-\text{NH}_2$  or  $-(\text{CH}_2)_4-\text{NH}-R^3$  wherein  $R^3$  is fluorescein.

31. (Original) Process for manufacturing a morpholino-nucleotide of formula (I):



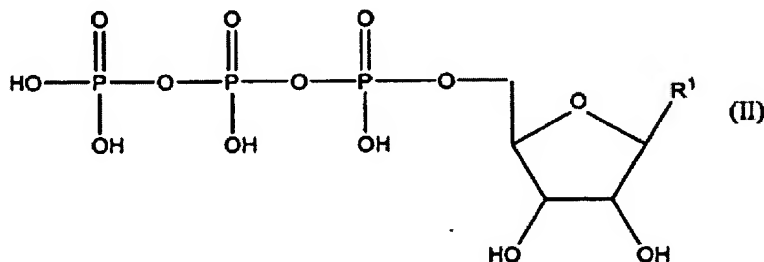
in which  $R^1$  represents a nucleic base and  $R^2$  is selected from the group consisting of:



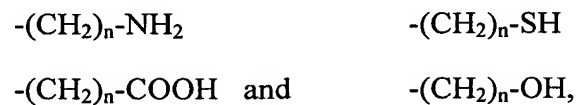
in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide,

said process comprising

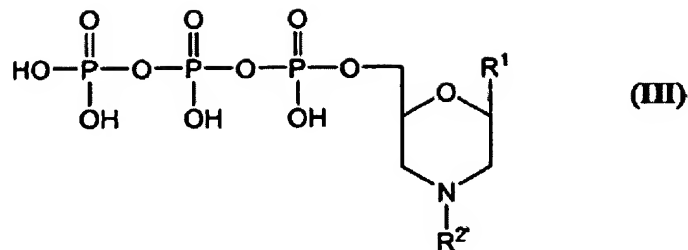
a) reacting a nucleoside triphosphate of formula (II):



with a periodate, a compound of formula  $R^{2'}-NH_2$ , wherein  $R^{2'}$  is selected from the group consisting of:



and sodium borohydride to form a morpholino-nucleotide of formula (III):



b) isolating the morpholino-nucleotide of formula (III); and

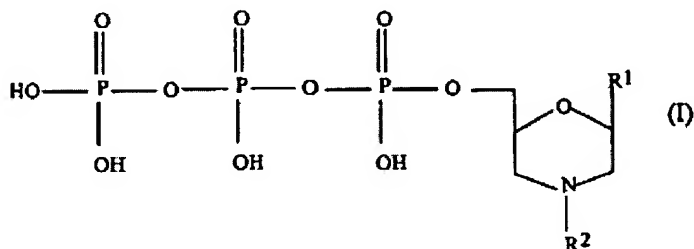
c) attaching  $R^3$  to the morpholino-nucleotide of formula (III) to form the morpholino-nucleotide of formula (I).

32. (Original): Process according to Claim 31, in which  $R^2$  is  $-(CH_2)_n-NH-R^3$  and  $R^3$  is fluorescein.

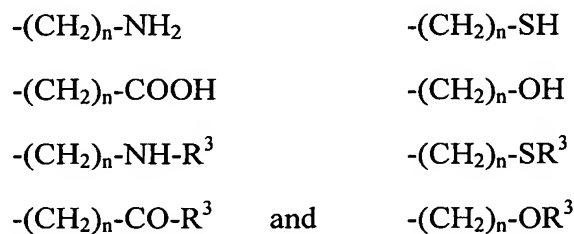
33. (Original): Process according to Claim 32, wherein n is 4.

34. (Original): Process according to Claim 31, wherein  $R^3$  is a fluorophore.

35. (Original): Process for manufacturing a morpholino-nucleotide of formula (I):

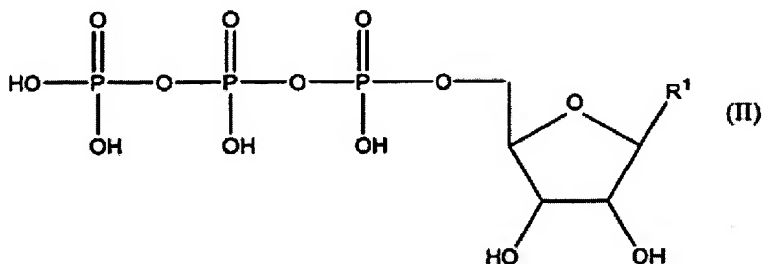


in which  $R^1$  represents a nucleic base and  $R^2$  is selected from the group consisting of:



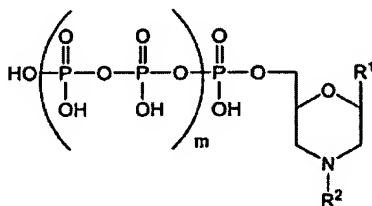
in which n is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide,

said process comprising reacting a nucleoside triphosphate of formula (II):

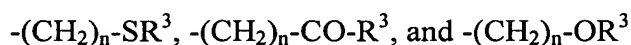


with a periodate, a compound of formula  $R^2NH_2$ , and sodium borohydride to form the morpholino-nucleotide of formula (I).

36. (Original): Process according to Claim 35, wherein  $R^3$  is a fluorophore.
37. (Original): Process according to Claim 35, in which  $R^2$  is  $-(CH_2)_n-NH-R^3$  and  $R^3$  is fluorescein.
38. (Original): Process according to Claim 37, wherein  $n$  is 4.
39. (New): Process for manufacturing a nucleic acid fragment comprising enzymatically incorporating at the 3' OH end of the nucleic acid fragment a modified morpholino-nucleotide having as precursor a compound of formula:



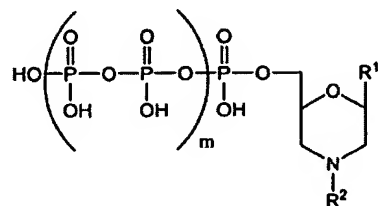
wherein  $R^1$  represents a nucleic base,  $m$  is 0 or 1, and  $R^2$  is selected from the group consisting of:



in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.



40. (New): Process according to Claim 39, in which an enzyme of said enzymatic incorporation is the Klenow fragment of DNA polymerase.
41. (New): Process according to Claim 39, in which an enzyme of said enzymatic incorporation is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.
42. (New): The process of Claim 39 wherein  $R^3$  is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.
43. (New): The process of Claim 39 wherein  $R^3$  is a fluorophore.
44. (New): The process of Claim 39 wherein  $R^3$  is selected from the group consisting of fluorescein, biotin, and rhodamine.
45. (New): Process for sequencing a nucleic acid comprising the technique of enzymatic polymerization of the sequence complementary to this nucleic acid using chain terminators at the 3' end of the complementary sequence, in which at least one of the chain terminators has as precursor a compound corresponding to formula:



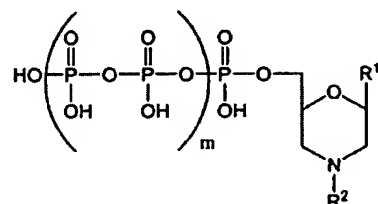
wherein  $R^1$  represents a nucleic base,  $m$  is 0 or 1, and  $R^2$  is selected from the group consisting of:



in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

46. (New): Process according to Claim 45, in which an enzyme of said enzymatic incorporation is the Klenow fragment of DNA polymerase.

47. (New): Process according to Claim 45, in which an enzyme of said enzymatic incorporation is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.
48. (New): The process of Claim 45 wherein  $R^3$  is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.
49. (New): The process of Claim 45 wherein  $R^3$  is a fluorophore.
50. (New): The process of Claim 45 wherein  $R^3$  is selected from the group consisting of fluorescein, biotin, and rhodamine.
51. (New): Process for modifying a nucleic acid fragment comprising enzymatically incorporating at the 3' end of the nucleic acid fragment a modified morpholino-nucleotide having as precursor a compound corresponding to formula:



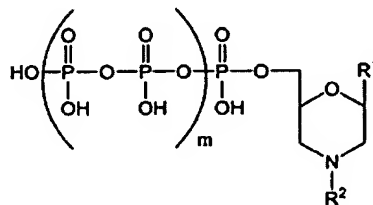
wherein  $R^1$  represents a nucleic base,  $m$  is 0 or 1, and  $R^2$  is selected from the group consisting of:



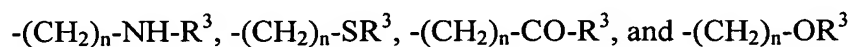
in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

52. (New): Process according to Claim 51, in which an enzyme of said enzymatic incorporation is the Klenow fragment of DNA polymerase.
53. (New): Process according to Claim 51, in which an enzyme of said enzymatic incorporation is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.

54. (New): The process of Claim 51 wherein  $R^3$  is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.
55. (New): The process of Claim 51 wherein  $R^3$  is a fluorophore.
56. (New): The process of Claim 51 wherein  $R^3$  is selected from the group consisting of fluorescein, biotin, and rhodamine.
57. (New): Process for manufacturing a nucleic acid fragment comprising enzymatically incorporating at the 3' OH end of the nucleic acid fragment a modified morpholino-nucleotide having as precursor a compound of formula:



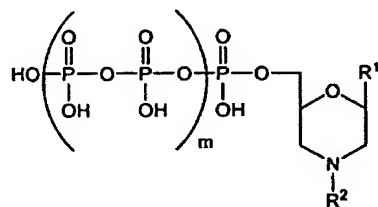
wherein  $R^1$  is a natural nucleic base selected from the group consisting of guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine;  $m$  is 0 or 1; and  $R^2$  is selected from the group consisting of:



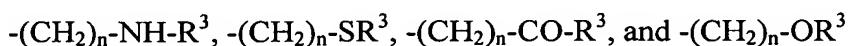
in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

58. (New): Process according to Claim 57, in which an enzyme of said enzymatic incorporation is the Klenow fragment of DNA polymerase.
59. (New): Process according to Claim 57, in which an enzyme of said enzymatic incorporation is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.

60. (New): The process of Claim 57 wherein  $R^3$  is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.
61. (New): The process of Claim 57 wherein  $R^3$  is a fluorophore.
62. (New): The process of Claim 57 wherein  $R^3$  is selected from the group consisting of fluorescein, biotin, and rhodamine.
63. (New): Process for sequencing a nucleic acid comprising the technique of enzymatic polymerization of the sequence complementary to this nucleic acid using chain terminators at the 3' end of the complementary sequence, in which at least one of the chain terminators has as precursor a compound corresponding to formula:



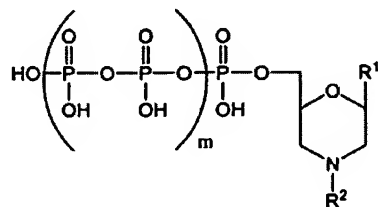
wherein  $R^1$  is a natural nucleic base selected from the group consisting of guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine;  $m$  is 0 or 1; and  $R^2$  is selected from the group consisting of:



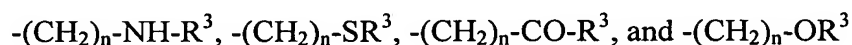
in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

64. (New): Process according to Claim 63, in which an enzyme of said enzymatic incorporation is the Klenow fragment of DNA polymerase.
65. (New): Process according to Claim 63, in which an enzyme of said enzymatic incorporation is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.

66. (New): The process of Claim 63 wherein  $R^3$  is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.
67. (New): The process of Claim 63 wherein  $R^3$  is a fluorophore.
68. (New): The process of Claim 63 wherein  $R^3$  is selected from the group consisting of fluorescein, biotin, and rhodamine.
69. (New): Process for modifying a nucleic acid fragment comprising enzymatically incorporating at the 3' end of the nucleic acid fragment a modified morpholino-nucleotide having as precursor a compound corresponding to formula:



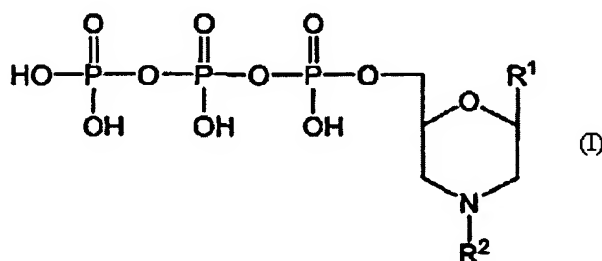
wherein  $R^1$  is a natural nucleic base selected from the group consisting of guanine, cytosine, thymine, uracil, xanthine, hypoxanthine, and 2-aminopurine;  $m$  is 0 or 1; and  $R^2$  is selected from the group consisting of:



in which  $n$  is an integer ranging from 1 to 12 and  $R^3$  is selected from the group consisting of a label, a protein, an enzyme, a fatty acid, and a peptide.

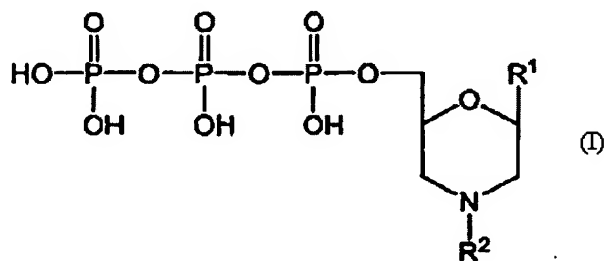
70. (New): Process according to Claim 69, in which an enzyme of said enzymatic incorporation is the Klenow fragment of DNA polymerase.
71. (New): Process according to Claim 69, in which an enzyme of said enzymatic incorporation is selected from the group consisting of a heat-resistant polymerase of a *Thermophilus* bacterium, a terminal transferase, and reverse transcriptase.

72. (New): The process of Claim 69 wherein  $R^3$  is a label selected from the group consisting of radioactive products, luminescent products, electroluminescent and fluorescent products, and enzymatic labels.
73. (New): The process of Claim 69 wherein  $R^3$  is a fluorophore.
74. (New): The process of Claim 69 wherein  $R^3$  is selected from the group consisting of fluorescein, biotin, and rhodamine.
75. (New): Process for manufacturing a nucleic acid fragment comprising enzymatically incorporating at the 3' OH end of the nucleic acid fragment a modified morpholino-nucleotide having as precursor a compound of formula (I):



wherein  $R^1$  is a nucleic base selected from the group consisting of adenine, guanine, cytosine, and thymine;  $R^2$  is  $-(CH_2)_4-NH-R^3$ ; and  $R^3$  is  $-C(S)-NH$ -fluorescein.

76. (New): Process for modifying a nucleic acid fragment comprising enzymatically incorporating at the 3' end of the nucleic acid fragment a modified morpholino-nucleotide having as precursor a compound of formula (I):



wherein  $R^1$  is a nucleic base selected from the group consisting of adenine, guanine, cytosine, and thymine;  $R^2$  is  $-(CH_2)_4-NH-R^3$ ; and  $R^3$  is  $-C(S)-NH$ -fluorescein.